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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,369	07/14/2004	Norbert Auner	PACO 0101 PUSA	9387

22045 7590 06/02/2009

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EXAMINER	
ZIMMER, ANTHONY J	
ART UNIT	**PAPER NUMBER**
1793	
MAIL DATE	**DELIVERY MODE**
06/02/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/501,369	AUNER, NORBERT	
	Examiner	Art Unit	
	ANTHONY J. ZIMMER	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 March 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *54-60* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *54-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Claim Objections

Claim 59 is objected to because of the following informalities: The claim depends from cancelled claim 1. For examination purposes, the claim will be assumed to depend from claim 54. Appropriate correction is required.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102/103

Claim 54 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hayha '896.

HAYHA teaches reducing silicon tetrafluoride (a halosilane) with an alkali or alkaline earth metal dispersed in a liquid intermediate agent, mineral oil(a nonpolar organic solvent) to produce amorphous silicon. See column 2, line 53- column 4, line 6

and Examples. The initial product is described as brown (see column 3, lines 61-64) but Hayha teaches cleaning the product using dichloromethane which would produce a black product. See column 4, lines 37-39.

Claim Rejections - 35 USC § 103

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 55-58 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayha '896 in view of Kauzlarich '786.

In regard to claims 55, 57, and 60, Hayha does not teach toluene or xylene as a solvent. Hayha suggests that other inorganic inert oils can be used. See column 3, lines 10-13. It would have been obvious to one of ordinary skill in the art to modify Hayha with Kauzlarich because Kauzlarich teaches a process of reducing halosilanes using sodium metal [0020]-[0021] and teaches using toluene and other aromatic solvents(xylene) as an inert, inorganic solvent. See [0030]. Thus, it would have been obvious to one of ordinary skill in the art to substitute one solvent for the other in order to produce silicon.

In re: claim 56, Hayha teaches sodium silicon fluoride. See col. 3, lines 23-26.

In regard to claim 58, Hayha teaches performing the reaction using molten sodium (above the melting temperature of sodium), see column 4, lines 21-23. Hayha also teaches using a boiling solvent. Although the claim requires the temperature to be below the boiling temperature of the solvent (xylene), this limitation does not impart a patentable distinction from the prior art because the ranges are close enough that one skilled in the art would not find an appreciable difference between the reaction carried out at a temperature just below the boiling point of the solvent and one carried out at the boiling point. See MPEP 2144.05.

Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayha in view of Bildl '571.

Hayha does not teach washing the produced silicon with ammonia.

However, it would have been obvious to one of ordinary skill in the art to modify Hayha with Bildl because Bildl teaches washing silicon with ammonia to produce a reaction-bonded product(a product coated with ammonia) followed by heating the product to remove the ammonia. See column 6, lines 54-57 of Bildl. One of ordinary skill in the art would have been motivated to make such a modification in order to produce a cleaner, purer product which is more valuable.

Response to Arguments

Applicant's arguments filed 3/24/2009 have been fully considered but they are not persuasive.

Applicant argues that black amorphous silicon is not produced because the particles have a reacted or coated surface.

However the initial product is described as brown (see column 3, lines 61-64) but Hayha teaches cleaning the product using dichloromethane which would produce a black product. See column 4, lines 37-39. Also, especially in regard to claim 54, it is noted that a process is being claimed and there are no recited process steps that distinguish the claim from the process of Hayha.

Applicant argues that the instantly claimed process is patentable over Hayha because the use of xylene or toluene enables the reaction to be carried out at a lower temperature.

However, it is known to use such aromatic solvents in the production of silicon as discussed above and the substitution of one organic solvent for another (used for the same purpose) would have been obvious to one of ordinary skill in the art in the absence of unexpected results. The production of silicon when using toluene or xylene is not unexpected because these solvents are known in the art to be used for this purpose. Also, it is known in the art that the reduction of a halosilane can be carried out at low temperatures including room temperature, and although Hayha teaches a preference for temperatures of 300-350°C, Hayha does not teach against using lower temperatures and states that the reaction temperature depends on the solvent (liquid intermediate agent) used. See Example 3 of Kauzlarich and col. 3 lines 45-47 of Hayha.

Furthermore, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. See MPEP 2144.05.

Applicant argues that Hayha teaches that using sodium silicon fluoride is undesirable. However, it appears that applicant took the citation of Hayha out of context (i.e. column 3, lines 54-56). Hayha discusses that when using silicon tetrafluoride it is desirable to avoid the formation of sodium silicon fluoride, a side product. This does not teach against using sodium silicon fluoride as a reactant. Also, in the taught process it is inevitable that at least a small amount of sodium silicon fluoride would be produced and reduced by sodium thus meeting the instant claim limitations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. ZIMMER whose telephone number is (571)270-3591. The examiner can normally be reached on Monday - Friday 7:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ajz

/Steven Bos/
Primary Examiner, Art Unit 1793